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(71) Applicant(s)

**Siemens Metering Limited**  
(Incorporated in the United Kingdom)  
Siemens House, Oldbury, BRACKNELL, Berkshire,  
RG12 8FZ, United Kingdom

(72) Inventor(s)

**Ian White**

(74) Agent and/or Address for Service

**Derek Allen**  
Siemens Shared Services Limited, Intellectual  
Property Department, Siemens House, Oldbury,  
BRACKNELL, Berkshire, RG12 8FZ, United Kingdom

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(56) Documents Cited

**GB 2309566 A EP 0152196 A2 WO 98/18251 A2****WO 88/04433 A1 US 3938091 A**

(58) Field of Search

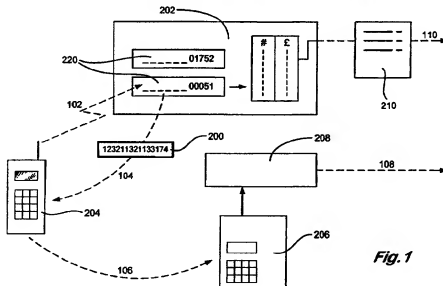
**UK CL (Edition R ) G4H HTG****INT CL<sup>7</sup> G07F , H04M****ONLINE:WPI,EPDOC,JAPIO**

(54) Abstract Title

**Utility billing infrastructure**

(57) Utility customers can pay for energy supplies or services (208) through the existing billing infrastructures of the telecommunications companies. Utility meters (206) use a payment technology that requires a multi-digit code sequence (200) to transfer credit values into each meter (206), for example KeyPad. The multi-digit code sequence (200) can be obtained by dialling a call centre (202) which provides the code sequence (200) audibly over the telephone connection. Payment for the code sequence (200), and hence for the energy or service, is obtained by the telecommunications company by means of special charging rates for the dialled call to the call centre (202). A customer can choose from a selection of calling centre numbers (220) according to the amount of credit that is required. Revenue is paid to the utility company by the telecommunications company through existing "premium rate" service arrangements in the telecommunications billing system.

Alternatively, the code sequence (200) may be sent direct to the meter (206).

**Fig. 1**

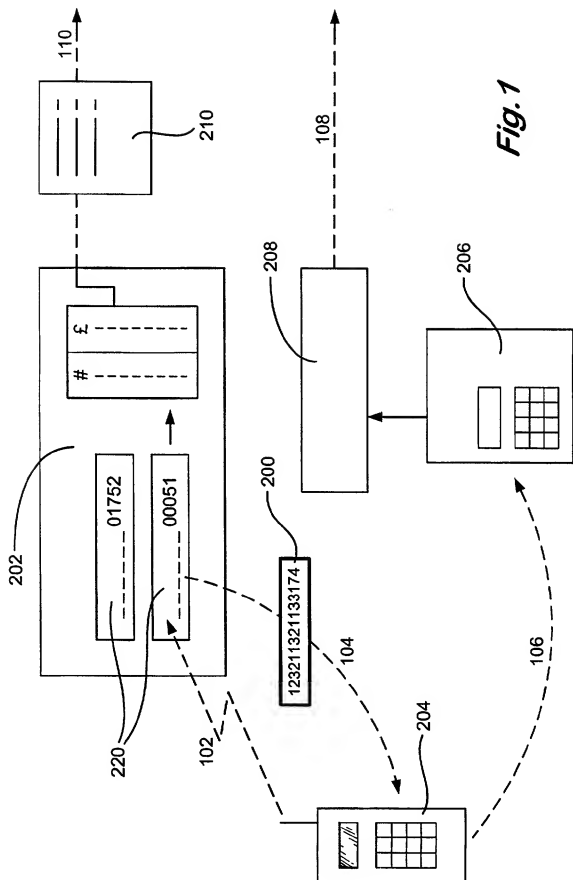


Fig. 1

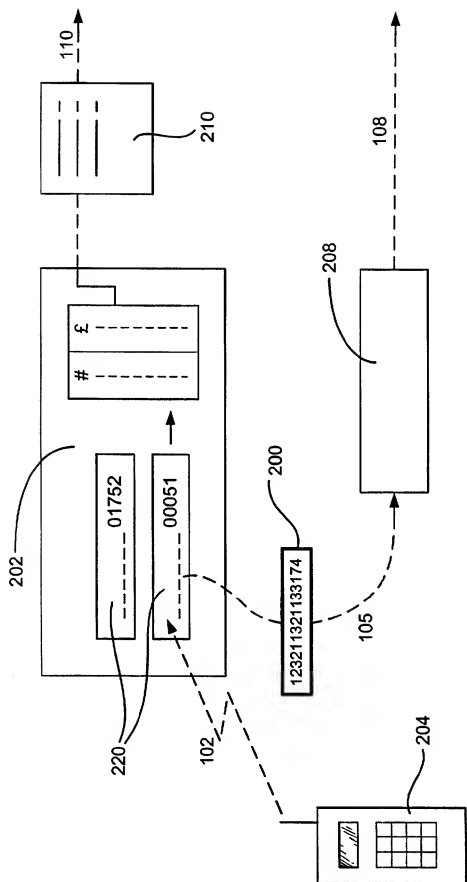


Fig.2

**UTILITY BILLING INFRASTRUCTURE**

The present invention relates to a utility billing infrastructure.

More particularly, the invention relates to a billing infrastructure for  
5 utility supplies and services through a known telecommunications billing  
infrastructure.

It is known to provide a utility supply device to supply a quantity of a  
utility, for example electricity, water or gas, upon transfer of a credit. The  
utility supply device can be operated by physical tokens, for instance coins or  
10 cards. Rather than use a physical token, the utility supply device can be  
arranged to require a valid multi-digit code sequence. The multi-digit code  
sequence is typed into a keypad unit that couples to the utility supply device,  
for example utility meters using the KeyPad technology from Siemens  
Metering Limited. Credit and tariff information is transferred to a given  
15 utility supply device by keying in the multi-digit code sequence: the code  
sequence is unique to the given utility supply device and to the information  
transferred. As an alternative to typing the multi-digit code sequence into a  
keypad unit, the code sequence can be entered one digit at a time using a  
single button to scroll through and choose from a menu of digits or the code  
20 sequence can be spoken into a data entry unit having a voice-recognition  
facility.

A given multi-digit code sequence can be generated to provide both  
authorisation and identification. As each utility supply device is unique, it is  
desirable that a given utility supply device will not accept codes intended for  
25 another utility supply device. The given code sequence can be used for  
identification by involving a customer number and/or a unique utility supply  
device identification number. Likewise, the given code sequence can assure  
the utility supplier that the customer has authorised a corresponding

transaction and is responsible for the charge incurred. Authorisation can be achieved by involving an authorisation password and/or an authorisation number in the code sequence.

Telecommunications systems allow telecommunications companies to bill for services provided in the systems. When a third party supplies a service over a given telecommunications system, billing for the service can be made by the third party directly or made on behalf of the third party by the telecommunications company. The latter scheme is known as a revenue sharing arrangement. Telecommunications companies, including BT, use revenue sharing arrangements to bill for Premium Rate Services (PRS), for instance, directory services, when supplied by third parties.

In accordance with the present invention, there is provided a method for supplying a predetermined quantity of a utility using a utility supply device coupled to a data entry unit that validates a multi-digit code sequence, the method including: requesting a multi-digit code sequence; providing the multi-digit code sequence in response to the request; entering the multi-digit code sequence into the data entry unit; and the data entry unit activating the utility supply device to supply a predetermined quantity of the utility when a valid multi-digit code sequence is entered.

The multi-digit code sequence is preferably distributed over a billed communications channel.

Preferably, the multi-digit code sequence is unique to the predetermined quantity and to the utility supply device.

The billed communications channel preferably connects to a call centre and the distribution of the multi-digit code sequence includes audible reproduction of the multi-digit code sequence by the call centre.

The audible reproduction of the multi-digit code sequence is, advantageously, a human operator at the call centre reading the multi-digit code sequence audibly over the billed communications channel.

Alternatively, the audible reproduction of the multi-digit code sequence  
5 is performed by a voice-capable computer at the call centre.

In a second aspect of the present invention, there is provided a method for supplying a predetermined quantity of a utility using a utility supply device coupled to a data entry unit that validates a multi-digit code sequence, the method including: requesting a multi-digit code sequence; transferring the  
10 multi-digit code sequence directly to the data entry unit in response to the request; and the data entry unit activating the utility supply device to supply a predetermined quantity of the utility when a valid multi-digit code sequence is entered.

The multi-digit code sequence may be requested over a billed  
15 communications channel.

The multi-digit code sequence is advantageously unique to the predetermined quantity and to the utility supply device.

The billed communications channel preferably connects the user to a call centre.

20 In either aspect of the invention, the billed communications channel is advantageously one of a plurality of billed communications channels and each of the plurality of billed communications channels corresponds to a respective predetermined quantity of the utility.

For a better understanding of the present invention, reference will now  
25 be made, by way of example only, to the accompanying drawing in which:-  
Figure 1 shows an embodiment of a system for activating the supply of predetermined quantity of a utility according to the present invention; and

Figure 2 shows a second embodiment of a system for activating the supply of predetermined quantity of a utility according to the present invention.

It should be noted that throughout the following description, identical reference numerals are used to identify similar parts.

Referring to Figure 1, the system for activating the supply of predetermined quantity of a utility has the following steps (indicated by dotted arrows): a customer dials in to a call centre 202 on a given one of a plurality of telephone numbers 220, where the given telephone number 220 corresponds to the quantity of utility required by the customer (step 102); the call centre 202 audibly gives the customer a unique multi-digit code sequence 200 (step 104); the customer then types the multi-digit code sequence 200 into her KeyPad unit 206 (step 106); and the meter 208 attached to the KeyPad unit 206 allows a corresponding volume of gas to be supplied (step 108) provided the multi-digit code sequence entered is valid. Meanwhile, the call centre 202 logs the call and the telecommunications company uses the call centre log to bill for access to the given telephone number 220 at a Premium Rate and passes on revenue from use of the given telephone number to the utility company (step 110).

When, for example, a customer wishes to buy a quantity of a utility, for instance, gas to be supplied to her heating system, she dials a call centre 202 on a telephone number corresponding to the quantity of gas required 220. The call is logged at the call centre 202 and a call centre operator reads out the correct multi-digit code sequence 200. The customer then types the multi-digit code sequence 200 into her KeyPad unit 206 and the meter 208 attached to the KeyPad unit 206 allows a corresponding volume of gas to be supplied. Meanwhile, the call centre 202 passes the call log to the telecommunications company, which in turn bills the customer for the call at a premium rate corresponding to the value of the quantity of gas purchased.

The step of distributing the multi-digit code is not limited to a human call centre operator reading the multi-digit code aloud over the telephone. A further communications channel can be used to directly transfer the multi-digit code to the meter 208. Examples of the further communications channel include power-line carrier or radio networks. In the case of direct transfer of the multi-digit code, the meter is suitably arranged to receive the code via the further communications channel.

In Figure 2, the system for activating the supply of predetermined quantity of a utility is identical to the system shown in Figure 1, except that the call centre 202 transfers a unique multi-digit code sequence 200 (step 105) directly to the utility meter 208, thus allowing a corresponding volume of gas to be supplied (step 108) provided the multi-digit code sequence transferred is valid.

When, for example, a customer wishes to buy a quantity of a utility, for instance, gas to be supplied to her heating system, she dials a call centre 202 on a telephone number corresponding to the quantity of gas required 220. The call is logged at the call centre 202.

In the embodiment shown in Figure 1, a call centre operator reads out the correct multi-digit code sequence 200. The customer then types the multi-digit code sequence 200 into her KeyPad unit 206 and the meter 208 attached to the KeyPad unit 206 allows a corresponding volume of gas to be supplied.

In the case of the second embodiment shown in Figure 2, the multi-digit code sequence 200 is transferred directly to the utility meter 208.

In both embodiments, the call centre 202 passes the call log to the telecommunications company, which in turn bills the customer for the call at a premium rate corresponding to the value of the quantity of gas purchased.

The utility can thus be accessed from either a private telephone or a public telephone 204. Although illustrated as a mobile telephone 204, the



private telephone can also be a conventional wired telephone. The bill payer for a private telephone or the user of a public telephone will be charged the premium rate tariff by the telecommunications company.

It will be understood that although the call centre is described in terms of having human operators, call centre facilities can also be provided by a voice-capable computer. The call centre can provide further services, for instance responding to enquiries and repetition of previously paid for codes for forgetful customers. To this end, the call centre can also be accessed by means of a standard rate or a free telephone number.

As an alternative to providing a plurality of telephone numbers each corresponding to a predetermined quantity of utility, the method of the invention can operate with just a single telephone number irrespective of quantity. The quantity can then be selected by direct access to a human operator, by dialling in further digits on the customers telephone or by communication with a computer operator, having voice-recognition capabilities for example.

Many types of billed communications channels may be provided: including password-controlled internet websites or portals; cable TV pay channels; and of course, premium rate telephone numbers. As in the embodiments described above, human operators or computers can distribute the necessary multi-digit code sequences via the billed communication channel.

**CLAIMS:**

1. A method for supplying a predetermined quantity of a utility using a utility supply device coupled to a data entry unit that validates a multi-digit code sequence, the method including: requesting a multi-digit code sequence;  
5 providing the multi-digit code sequence in response to the request; entering the multi-digit code sequence into the data entry unit; and the data entry unit activating the utility supply device to supply a predetermined quantity of the utility when a valid multi-digit code sequence is entered.
- 10 2. A method as claimed in Claim 1, wherein the multi-digit code sequence is distributed over a billed communications channel.
3. A method as claimed in Claim 2, wherein the multi-digit code sequence is unique to the predetermined quantity and to the utility supply device.
- 15 4. A method as claimed in Claims 2 or 3, wherein the billed communications channel connects the user to a call centre and the distribution of the multi-digit code sequence includes audible reproduction of the multi-digit code sequence by the call centre.
- 20 5. A method as claimed in Claim 4, wherein the audible reproduction of the multi-digit code sequence is a human operator at the call centre reading the multi-digit code sequence audibly over the billed communications channel.

6. A method as claimed in Claim 4, wherein the audible reproduction of the multi-digit code sequence is performed by a voice-capable computer at the call centre.

5 7. A method for supplying a predetermined quantity of a utility using a utility supply device coupled to a data entry unit that validates a multi-digit code sequence, the method including: requesting a multi-digit code sequence; transferring the multi-digit code sequence directly to the data entry unit in response to the request; and the data entry unit activating the utility supply  
10 device to supply a predetermined quantity of the utility when a valid multi-digit code sequence is entered.

8. A method as claimed in Claim 7, wherein the multi-digit code sequence is requested over a billed communications channel.

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9. A method as claimed in Claim 8, wherein the multi-digit code sequence is unique to the predetermined quantity and to the utility supply device.

10. A method as claimed in Claims 8 or 9, wherein the billed  
20 communications channel connects the user to a call centre.

11. A method as claimed in any one of the preceding claims, wherein the billed communications channel is one of a plurality of billed communications channels and each of the plurality of billed communications channels  
25 corresponds to a respective predetermined quantity of the utility.

12. A method substantially as hereinbefore described with reference to the accompanying drawings.



INVESTOR IN PEOPLE

Application No: GB 0009701.4  
 Claims searched: 1-12

Examiner: Mike Davis  
 Date of search: 18 July 2000

## Patents Act 1977 Search Report under Section 17

### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:  
 UK Cl (Ed.R): G4H (HTG)  
 Int Cl (Ed.7): G07F, H04M  
 Other: Online: WPI, EPODOC, JAPIO

### Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB 2309566 A (FORD) eg abstract and page 2 lines 26-29	1,7 at least
X	EP 0152198 A2 (SCHLUMBERGER) eg abstract, page 4 line 4 to page 7 line 20, and page 8 line 28 to page 9 line 18	"
X	WO 98/18251 A2 (PHILIPS) eg abstract	"
X	WO 88/04433 A1 (SLOAN) eg abstract and page 12 lines 15-27	"
X	US 3938091 (ATALLA ET AL) eg abstract	"

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.